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EXAMINER

CHO, UN C

ART UNIT PAPER NUMBER

2617

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 04/10/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/717,799

Applicant(s)

LIM ET AL.

Examiner

Un C. Cho

Art Unit

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 14 and 18 is/are rejected.
- 7) ☒ Claim(s) 6-13 and 15-17 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

* Previous office action mailed on 3/22/2007 has been vacated and is replaced with the office action below due to a typographical error in the office action summary.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 7/5/2005 has been placed in record and considered by the examiner.

Claim Objections

3. Claims 5 and 17 are objected to because of the following informalities:

Claim 5, lines 9 – 13 recites, “reserved radio resources are used allocated by the shared allocation, and wherein the radio resources are selected among the radio resources that not used for the other reserved allocation in the current frame.” It is unclear as to what the applicant is trying to claim.

Claim 17, line 1 recites, “The method as recited in claim 1,” it should be recited as “The method as recited in claim 15,” instead because claim 17 refers to the step b5) which is recited in claim 15 and not claim 1.

Appropriate correction is required.

The examiner kindly requests the applicant to carefully review claims 1 – 18 for any typographical/grammatical errors.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 2, 3, 5 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 18 recites the limitation "the selected radio resource" in line 5 of step d) and also line 1 of step e).

Claim 2 recites the limitation "the beams adjacent" in lines 1 – 2 of the claim.

Claim 3 recites the limitation "the adjacent beam" in lines 2 – 3 of the claim.

Claim 5 recites the limitation "the other reserved allocation in the current frame" in lines 12 – 13.

There is insufficient antecedent basis for these limitations in the claims.

For purpose of prior art rejection, the broadest and reasonable interpretation will be given to the above-mentioned claims. Moreover, the examiner kindly requests the applicant to carefully review claims 1 – 18 for any 112 2nd issues.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3, 4 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haugli et al. (US 7,142,521 B2) in view of Katz et al. (US 7,072,692 B1).

Regarding claim 1, Haugli discloses an adaptive packet transmission method in a cellular mobile communication system using a multibeam satellite, comprising the steps of: a) being periodically reported, from mobile station, of average receiving power levels of beam pilot signals transmitted in a plurality of beams (Haugli: Col. 5, lines 43 – 46); b) estimating a path gain between beams and the mobile station based on the reported average power levels of beam pilot signals; c) determining priorities for packets to be transmitted to each of the mobile stations (Haugli: Col. 8, lines 1 – 9).

However, Haugli as applied above does not specifically disclose d) selecting a beam requiring the lowest transmission power for transmitting the packet having the highest priority, and allocating the lowest power required for satisfying a predetermined packet reception quality when the packet is transmitted in the selected radio resource, by using the path gain estimated for each of the mobile stations; and e) if the radio resources and/or the transmission power that can be used are not sufficient or if there is a packet to be allocated,

performing the step c). In an analogous art, Katz remedies the deficiencies of Haugli by disclosing such limitation in Col. 11, line 48 through Col. 12, line 57 whereas beam selection is based on power as well as traffic condition.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Katz to the system of Haugli in order to provide an improved method for directional radio communication.

Regarding claim 3, Haugli in view of Katz as applied above discloses wherein in the step b), the path gain between the mobile station and the adjacent beam is estimated based on a ratio of the pilot transmission power to the average received power of the pilot signal reported from the mobile station (reporting measurements; Haugli: Col. 8, lines 1 – 9).

Regarding claim 4, Haugli in view of Katz as applied above discloses wherein the radio resource is divided into a predetermined number of frames, wherein in a time domain, each frame is divided into one or more time slots, a beam signal is transmitted over multi-carrier; in a frequency domain, each frame is divided into one or more frequency slots, a signal is being transmitted over multiple subcarriers; and in a code domain, each frame is divided into one or more spreading codes, a signal is transmitted using a spreading code, and wherein each frame is divided by a combination of two or three of the frame division methods (Haugli: Col. 9, line 11 through Col. 10, line 56).

Regarding claim 14, Haugli in view of Katz as applied above discloses wherein the transmission mode of radio resources is one selected from one or more transmission modes which are combinations of modulation mode and encoding mode; and the radio resources are allocated using one of the transmission modes as a basic transmission mode in a predetermined case, and if there are usable radio resources but the power is not sufficient to perform the basic transmission mode, a transmission mode having a low transmission rate is used to transmit the selected packet, or if the usable radio resources are not sufficient but the power can be used sufficiently, a transmission rate having a high transmission rate is used to obtain additional radio resources and transmit a packet selected by the additional radio resource to a user having the largest GIR (Haugli: Col. 9, line 11 through Col. 10, line 56 and Katz: Col. 11, line 48 through Col. 12, line 57).

Regarding claim 18, the claim is interpreted and rejected for the same reason as set forth in claim 1.

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haugli in view of Katz as applied to claim 1 above, and further in view of Lalezari (US 6,759,978 B2).

Regarding claim 2, Haugli in view of Katz as applied above does not specifically disclose wherein the beams adjacent to the mobile station belong to an active beam set including a primary beam having the largest average received

SINR of a pilot signal and a beam corresponding to a pilot signal whose pilot SINR ratio is larger than or equal to a value obtained by multiplying a fixed rate smaller than 1 by the largest pilot SINR. In an analogous art, Lalezari remedies the deficiencies of Haugli in view of Katz by disclosing such limitation in Col. 3, line 63 through Col. 4, line 37. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Lalezari to the modified system of Haugli in view of Katz in order to provide an efficient system to control over beam direction as well as the link margin due to the increased gain of such currently receiving antennas.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haugli in view of Katz as applied to claim 1 above, and further in view of Castellano (US 6,674,750 B1).

Regarding claim 5, Haugli in view of Katz as applied above does not specifically disclose wherein the packet allocation is performed based on service requirements, and the packet allocation includes reserved allocation and shared allocation, wherein in case of a service using the reserved allocation, radio resources required for transmitting the packet are allocated in each frame when the service is established initially, and if there is an additional packet to be transmitted, reserved radio resources are used allocated by the shared allocation, and wherein the radio resources are selected among the radio resources that not used for the other reserved allocation in the current frame. In

an analogous art, Castellano remedies the deficiencies of Haugli in view of Katz by disclosing such limitation in the Abstract (allocating a portion of a data transmission bandwidth of the shared bus, to the transmission of packet data). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the technique of Castellano to the modified system of Haugli in view of Katz in order to provide a common bus structure for the integration packet/TDM traffic.

Allowable Subject Matter

8. The following is a statement of reasons for the indication of allowable subject matter:

9. Regarding claims 6 – 13 and 15 – 17 Haugli in view of Katz, in view of Lalezari, and further in view of Castellano either alone or in combination fails to teach the priority of each packet to be transmitted is calculated based on an equation shown in claim 6; the gain-to-interference ration (GIR) defined by an equation shown in claim 9; power allocation method expressed by an equation shown in claim 13; further limiting the step b) shown in claim 15 and further limiting the step b5) shown in claim 17.

10. Claims 6 – 13 and 15 – 17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Niesen (US 7,068,615 B2) discloses an adaptable forward link data rates in communications systems for mobile platforms.

Natali et al. (US 6,317,412 B1) discloses an increased capacity in an OCDMA system for frequency isolation.

Wright et al. (US 6,272,340 B1) discloses a load shedding method to enhance uplink margin with combined FDMA/TDMA uplinks.

Patterson et al. (US 6,850,732 B2) discloses a scalable satellite data communication system that provides incremental global broadband service using earth-fixed cells.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Un C. Cho whose telephone number is (571) 272-7919. The examiner can normally be reached on M ~ F 8:00AM to 4:30PM.

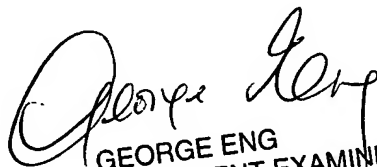
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Eng can be reached on (571) 272-7495. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2617

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Un C Cho
Examiner
Art Unit 2617

4/3/07 *UC*


GEORGE ENG
SUPERVISORY PATENT EXAMINER